## HISTORY OF SCIENTIFIC PROGRESS.

AMONG THE WORKERS IN SILVER. BY JAMES PARTON.

From the Atlantic Monthly. Excursionists to Lake Superior, when they get away up in the northern part of Lake Huron, where those "four thousand islands" lying flat and green in the sun, without a tree or a but upon them, see at length, in the distance, a building like a large storehouse, evidently not made by Indian hands. The thing is neither rich nor rare; the only wonder is, how it got there. For many hours before coming in sight of this building, no sign of human life is visible, unless, perchance, the joyful passengers catch the sight of a dug-out canoe, with a blanket for a sail, in which an Indian fisherman sits solitary and motionless, as though he, too, were one of the inanimate features of the scene. On drawing near this most unexpected structure, the curlosity of the travellers is changed into wild wonder. It is a storehouse with all the modern improvements, and over the door is a wellpainted sign, bearing the words "Raspberry Jam."

If the present writer, when he first beheld this sign, had read thereon "opera glasses for hire, or "kid gloves cleaned by a new and improved method," he could not have been more surprised or more puzzled. The explanation, however, was very simple. Many years ago, it seems, a Yankee visiting that region discovered thousands upon thousands of acres of raspberry bushes banging tuli of fruit, and all going wasic. He also observed that Indian girls and nuaws in considerable numbers lived near by. Putting this and that together, he conceived idea of a novel speculation. In the summer fol-lowing he returned to the place with a copper kettie, many barrels of sugar, and plenty of large stone jars. For one cent a pail he bad as many raspberries picked as he could use; and he boiling and jarring until he had filled all his vessels with jam, when he put them on board a sloop, took them down to Detroit, and sold them. The article being approved, and the specuation being profitable, he returned every year to the raspberry country, and the business grew to an extent which warranted the erection of his large and well-appointed building. In the Western country the raspberry jam made in the region of Lake Huron has been for twenty years an established article of trade. We had the curiosity once to taste tarts made of it, and can testify that it was as bad as heart could wish. It appeared to be a soggy mixture of melted brown sugar and small seeds

But that is neither here nor there. The oddity

our adventure was in discovering such an establishment in such a place. Since that time often had similar surprises, especially in New England, where curious industries have established themselves in the most out-of-theway nooks. In a hamlet of three or four houses and a church we see such signs as "Melodeon Manufactory." At a town in Northern Vermont we find four hundred men busy the year round in making those great Fairbanks' Scales which can weigh an apple or a train of cars. There is nothing in St. Johnsbury which marks it out as the town in the universe fittest to produce huge scales for mankind. The business exists there because, forty years ago, there were three excel-lent heads in the place upon the shoulders of three brothers, who put those heads together and learned how to make and how to sell scales. All over New England, industrie have rooted themselves which appear to have no congruit," with the places in which they are found. We heard the other day of a village in which are made every year three bushels of gold rings. We ourselves passed, some time ago, in a remarkably plain w England town, a manufactory of tine diamond jewelry. In another town—Providence— there are seventy-two manufactories of common jewelry. Now what is there in the character or in the situation of this city of Roger Williams that should have invited thither so many makers of cheap trinkets? It is a solid town, that makes little show of its great wealth, and contains less than the average number of people capable of wearing tawdry ornaments. Nevertheless, along with machine shops of Titanic power, and cotton mills of vast extent, we find these seventy-two manufactories of ewelry. The reason is, that about the 1795 one man, named Dodge, prospered in Providence by making such jewelry as the simple people of those simple old times would buy of the passing peddler. His prosperity lured others into the business, until it has grown to its present proportions, and supplies half the country with the glittering trash which we all despise upon others and love upon ourselves.

But there is something at Providence less to be expected even than seventy-two manufactories of lewelry; it is the largest manufactory of solid silverware in the world 1 In a city so elegant and refined as Providence, where wealth is so real and stable, we should naturally expect to find on the sideboards plenty of silver plate; but we were unprepared to discover there three or four hundred skilful men making silverware for the rest of mankind, and all in one establish ment-that of the Gorham Manufacturing Company. This is not only the largest concern of the kind in existence, but it is the most com-This is not only the largest concern of plets. Every operation of the business, from the melting of the coin out of which the ware is made, to the making of the packing-boxes in which it is conveyed to New York, takes place in this one congregation of buildings. Nor do we hesitate to say, after an attentive examina-tion of the products of European taste, that the articles bearing the stamp of this American house are not equalled by those imported. There is a fine simplicity and boldness of outline about the forms produced here, together with an absence of useless and pointless ornament. which render them at once more pleasing and more useful than any others we have seen. It was while going over this interesting esta-blishment that the raspberry jam incident re-

curred to us. This thing, however, is both rich and rare; and yet the wonder remains how it got there. It got there because, forty years ago, an bonest man began there a business which has grown steadily to this day. It got there just as all the rooted business of New England got where we find them now. In the brief history of this one enterprise we may read history of the industry of New England. Not the less, however, ought the detailed history to be written; for it would be a book full of every kind of unforces. kind of interest and instruction.

It was an honest man, we repeat, who founded this establishment. We believe there is no house of business of the first class in the world, of thirty years' standing, the success of which is not clearly traceable to its serving the public with fidelity. An old clerk of Mr. A. T. Stewart, of New York, informed us that, in the day of small things, many years ago, when Mr. Stewart had only a retail dry goods store of blishment was thus:—"Bon't recommend goods, atruggling with the difficulties of a new business be a very honest or a very able man. He is rily honest. It is not surprising, there are, that Mr. Stewart is now the monarch of the dry woods trade in the world; and we fully believe that he history of all lasting success would disclose a similar root of honesty. In all the businesses which have to do with the precious metals and precious stones, honesty is the prime necessity: because in them, though it is the easiest thing the world to cheat, the cheat is alway capable of being detected and proved. A great capable of being detected and proved. A great silver house holds itself bound to take back an article of plate made forty years ago, if it is discovered that the metal is not equal in purity to the standard of the allver coin of the country in which it was made. The entire and perfect natural honesty, therefore, of Jabes Gorham, was the direct cause of the prosperity of the house which he founded. He is now a series and healthy man of eighty-two long ago. erene and healthy man of eighty-two, long ago retired from business. He walks about the manufactory, mildly wondering at the extent to which its operations have extended. "It is grown past me," he says with a smile; "I know mething about all this."

In the year 1805 this venerable old man was an apprentice to that Mr. Dodge who began in Providence the manufacture of ear-rings, breast prine, and rings—the only articles made by the Providence jewelers for many years. In due time Jabez Gorham set up for himself, and he added to the list of articles the important item of watch-chains of a peculiar pattern, lon known in New England as the "Gorham chain. The old gentleman gives an amusing account o the simple manner in which business was done When he had manufactured trunkful of jeselry he would jog away with it to Boston, where, after depositing the trunk in his room, he would go round to all the jeweilers in the city to inform bem of his arrival, and to say that his jewelry would be ready in his room for inspection on the following morning at 10 o'clock, and not before. Before the appointed hour every jeweller in the town would be door; but as it was a point of honor to give them all an equal chance, no one was admitted till the clock struck, when all pushed in in a body. The jewelry was spread out on the bed, around which all the jewellers of Beston, in 1870, could gather without crowding. Each man began by placing his bat it some convenient place, and it was in his ha that he deposited the articles selected by him for purchase. When the whole stock had transferred from the bed to the several hats, Mr. Gorbam took a list of the contents of each; whereupon the jewellers packed their purchases and carried them home. In the course of the ing Mr. Gorbam went his rounds and collected the money. The business being thus happily concluded, he returned to Providence, to work uninterrupted of or another six months. In this manner Jabez Gorham conducted business for ixteen years before he ever thought of attempting stiverware. Such was his reputation for scrupolous honesty that, for many years before e left the business none of his customers ever subjected his work to any test whatever, not even to that of a pair of scales. It is his boast that during the whole of his business career of more than half a century he, never sold an arti-cle of a lower standard of purity than the one established by law or by the nature of the precous metals

About the year 1825 some Boston people dis covered that a tolerable silver spoon could be made much thinner than the custom of the trade had previously permitted, and that thes thin spoons could be sold by peddlers very advantageously. The consequence of this discovery was that silver spoons became an article of manufacture in Boston, whence peddlers conveyed them to the remotest nooks of New England. One day, in 1830, the question occurred to Jabez Gorham, why not make spoons in Providence, and sell them to the peddlers who buy our jewelry? The next time he took his trunk of trinkets to Boston he looked about him for a man who knew something of the art of spoon-making. One such he found, a young man out of his time," whom he took back him to Providence, where he established him in an odd corner of his jewelry shoe. In this way, thirty-seven years ago, the business began which has grown to be the largest and most complete manufactory of silver ware in the world. For the first ten years he made nothing but spoons, thimbles, and silver combs, with ac occasional napkin-ring, if any one in Provi dence was bold enough to order one. Busi nesses grew very slowly in those days. thought a grand success when Jabez Gorbam, after nearly twenty years' exertion, had fifteen men employed in making spoons, torks, thim bles, napkin-rings, children's mugs, and such small ware. Nor would Mr. Gorham, of his own motion, have ever carried the busines much further; certainly not to the point of producing articles that approach the rank of works of art. We have heard the old gentleman say that he often stood at a store-window in Boston. wondering by what process certain operations were performed in silver, the results of which he saw before him in the form of pitchers and

But in due course of time Mr. John Gorbam the present head of the house, eldest son of the founder, came upon the scene—an aspiring, ingenious young man, whose nature it was to excel in anything in which he might chance to engage. The silversmith's art was then so little known in the United States that neither work-men nor information could be obtained here in its higher branches. Mr. John Gorham crossed the ocean soon after coming of as ined every leading silver establishment in Europe. He was freely admitted everywhere, as no one in the business had ever thought of America as a possible competitor; still less did any one see in this quiet Yankee youth the person who was to annihilate the American demand for European silverware, and produce articles which tamous European houses would servilely copy. From the time of Mr. John Gorham's return dates the eminence of the present company and of the production of the costlier kinds of silverware, on a great scale, in the United From first to last the company have induced sixty-three accomplished workmen to from Europe and settle in Providence, some of whom might not unjustly be enrolled in

the list of artists. The war gave an amazing development to this business, as it did to all others ministering to pleasure of the sense of beauty. When the war began, in 1861, the Gorham Company cuployed about one hundred and fifty men; and in 1864 this number had increased to four hundred, all engaged in making articles of solid silver. Even with this great force the company were sometimes unable to supply the demand for their beautiful products. On Christmas morning, 1864, there was left in the store in Maider lane, New York, but seven dollars worth of ware, out of an average stock of one hundred thousand dollars' worth. Perhaps we ought not to be surprised at this. Consider our silver It is not unusual for several thou sands of dollars' worth of silver to be presented on these occasions-in one instance, sixteen thou sand dollars worth was given, And what lady can be married, nowadays, without having a few pounds of silver given to her? For Christmas presents, of course, silverware is always among the objects dangerous to the sanity of those who go forth, just before the holidays, with a limited purse and unlimited destres.

What particularly surprises the visitor to the Gorham Works, at Providence, is to see labor-saying machinery—the ponderous steam hammer, the stamping and rolling apparatus-e:nployed in silver work, instead of the baser metals to which they are usually applied. Nothing is done by hand which can be done by machinery; so that the three hundred men usually employed in solid ware are in reality doing the work of a thousand. The first opera-tion is to buy silver coin in Wall street. In a bag of dollars there are always some bad pieces and as the Company embark their reputation in every silver vessel that leaves the factory, and are always responsible for its purity, each dottar s wrenched asunder and its goodness positivel ascertained before it is thrown into the crucible The subsequent operations, by which these spoiled dollars are converted into objects of brilliant and enduring beauty, can better be

imagined than described. New forms of beauty are the constant study of the artist in silver. One large apartment in the Gorham establishment—the artists' room—is a kind of magazine or storehouse of beautifu forms, which have been gathered in the course of years by Mr. George Wilkinson, the member of the Company who has charge of the design ing, and who is himself a designer of singular taste, fertility, and judgment. Here are de posited copies or drawings of all the former oroducts of the establishment. Here is a large and costly library of litustrated works in every department of art and science. Mr. Wilkinson gets has from works upon botany, sculpture, landscape from works upon botany, sculpture, porcelain; pit more frequently from those large ture. "The first requisite," he maintains, "of a The artist in silver like is that it be nell build," in view the practical am so to keep constantly of his art. The forms with he designs must be labor and material, such as can be designs must be labor and material, such as can be designs must be also and material, such as can be designs must be labor and material, such as can be assigned the alternation of the latternation of real excellence, that Mr. Wilkinson has given such celebrity to the articles made by the company to which he belongs. products of the establishment. Here is a large

Few of us, however, will ever he able to buy the dinner sets, the tea sets, the corgeous entrers, and the tall epergues with which the sarcrooms of this manufactory are filled liver salver of large size costs a thousand dol dinner set for a party twenty-four costs \$12,000. The price of a nice tea set can easily run into \$3000. We noticed one small vase, six or eight inches high, exqui-sitely chased on two sides, which Mr. Wilkin-son assured us cost the Company about \$700 to produce. There are, as yet, but two or three persons in all America who would be likely to become purchasers of the articles in silver which rank in Europe as works of art, and which are strictly entitled to that distinction The wonder is who buys the massive utilitie that are stacked away in such profusion in Maiden lane, The Gorham Company have always in course of manufacture about three fons of silver, and usually have a ton of finished

An important branch of the business is one recently introduced-the manufacture of a very superior kind of plated-ware, intended to com-bine the strength of baser metal with th beauty of silver. The manufacture of such ware has attained a great development in England of late years, owing chiefly to the appli-cation of the mysterious power of electricity to the laying on of the silver. We must discourse a little upon this admirable application of science to the arts.
"Hamiet" amused his friend "Horatio" by

racing the noble dust of Alexander till he found it stopping a bunghole. If we trace the course of discovery that resulted in this beautiful art, we shall have to reverse "Hamlet's" order; we must begin with the homely object and end with magnificent ones. Electroplating, electrotyping, the electric telegraph, and many other arts and wonders, all go back to that dish o frogs which the smisble and fond Professor Galvani was preparing for his sick wife's dinner one day. about the year 1787. It was a curious reflection when we were illuminating our houses to cele-brate the laying of the first Atlantic cable, that this bewildering and unique triumph of man over nature had no more illustrious origin than the legs of an Italian frog. We are aware that the honor has been claimed for a Neapolitan There is a story in the books of a mouse in Naples that had the impudence, in 1786, to bite the leg of a professor of medicine, and was caught in the act by the Professor himself, who punished his audacity by dissecting him. While ocing so, he observed that when he touched a nerve of the creature with his its limbs were slightly convulsed. The Pro-lessor, struck with the circumstance, was puzzled by it, mentioned it, and it was recorded; but as nothing further came of if, no connection can be established between that mouse and the splendors of silver-plated ware and the wonders of the telegraph. The claims of Professor Galvani's frog rest upon a sure foundation of fact. Signora Galvani-so runs one version of the story-lay sick upon a couch in a room in which there was that chaos of domestic utensils and philosophical apparatus that may still be observed sometimes in the abodes of men addicted to science. The Professor himself had prepared the frogs for the stewpan, and left them upon a table near the conductor of an electrical machine. A student, while experimenting with the machine, chanced to touch with a steel instrument one of the frogs at the intersection of the legs. The sick lady observed that as often as he did so the legs were convulsed, or, as we now say, galvanized. Upon her husband's return to the room she mentioned this strange thing to him, and he immediately repeated the experiment.

From 1760 to 1790, as the reader is probably aware, all the scientific world was on the qu vice with regard to electricity. The most bril liant reputations of that century had been won by electric discoveries. Franklin was still alive, to reward with his benignant approval those who should contribute anything valuable. atter his own immense additions, to man's know edge of this alluring and baffling element. It was, therefore, as much the spirit of the time as the penius of the man that made Galvani scize this new fact with eagerness, and investigate it with untiring enthusiasm. It was a sad Signora Galvani observed those two naked legs fly apart and crook themselves with so much animation. There was slaughter in the swamps of Bologna for many a month thereafter. For mankind, however, it was a day to be held in everlasting remembrance, since it was then that was taken the first step towards the galvanic battery!

As fortune favors the brave, so accident ald the ingenious. After Professor Galvani had touched the muscles and nerves of many frogs the spark drawn from the ele machine, another accident occurred which led firectly to the discovery of the galvanic battery Having skinned a frog, he chanced to hang by a copper hook upon an iron nail; and thus without knowing it, he brought together the elements of a battery—two metals and a wet frog. His object in hanging up the frog was to see if the electricity of the atmosphere would produce any effects, however slight, similar to those produced when the spark of the machine was applied to the creature. It did not, After watching his frog awhile, the Professor was proceeding to take it down, and while in the act of doing so the legs were convulsed. Struck with this occurrence, he replaced the frog, took it down again, put it back, took it down, until he discovered that, as often as the damp frog (still hanging upon its iron hook) touched the iron nail, the contraction of the muscles took place, as if the frog had been touched by a conductor con-nected with an electrical machine. This experiment was repeated hundreds of times, and varied in as many ways as mortal ingenuity could devise. Galvani at length settled down upon the method following:-He wrapped the nerves taken from the loins of a frog in a leaf of tin, and placed the legs of the freg upon a plate of copper; then, as often as the leaf of tin was brought in contact with the plate of copper, the legs of the frog were convulsed,

People regard Charles Lamb's story of the discovery of roast pig as a most extravagan and impossible fiction; but, really, Professor Galvani comported himself very much in the manner of that great discoverer. It was no more necessary to employ the frog's nerves in the production of the electricity, than it was necessary to burn down a house in roasting for dinner. The poor frog contributed nothing to it but his dampness-as every boy in a tele graph office now perceives. He was merely the bet in the small galvanic battery. Professor Galvani, however, exulting in his discovery, leaped to the conclusion that this electricity was not the same as that produced by friction.
He thought be had discovered the long-sought
something by which the muscles move obedient
to the will. "All creatures," he wrote, "have an electricity inherent in their economy, which resides specially in the nerves, and is by the nerves communicated to the whole body. It is secreted by the brain. The interior substance of the nerves is endowed with a conducting power for this electricity, and facilitates its movement and its passage from one part of the nervous system to another; while the oily costing of these organs hinders the dissipation of the fluid, and permits its accumulation." He also thought that the muscles were the Leyden jars of the animal system, in which the elec-tricity generated by the brain and conducted by the nerves was hoarded up for use. When a man was tired, he had merely used his electricity too fast; when he was fresh, his Leyden The publication of these experiments in 1791,

The publication of these experiments in 1794, accompanied by Galvani's theory of animal electricity, produced a sensation in scientific circles only inferior to that caused by Franklin's demonstration of the identity of lightning with electricity, thirty years before. The murder of innocent frogs extended from the marshes of Bologna to the swamps of all Christian of Wharman " edward a writer of the tendom. "Wherever," says a writer of the time, "frogs were to be found and two different metals could be procured, every one was auxious to see the mangled limbs of frogs brought to life in this wonderful way." Or, as amb says, in the description upon Roast Pig "The thing took wing, and now there was nothing to be seen but fire in every direction." At first the facts and the theory of Galvani were equally accepted; and a grateful world invisted upon styling the new science, as it was deemed, "Galvanism." Thus a word was added to all the languages, which has been found useful in its

literal sense, and forcible in its figurative. Whatever we may think of Galvani's philosophy. we cannot deay that he immortalized his nam We cannot deay that he immortalized his name. He died a few years after, fully satisfied with his theory, but having no suspicion of the many, the peculiar, the marvellous results that were to flow from the chance discovery of the fact that a moist frog piaced between two different metals was a kind of electrical machine. Among the Italians who caught at Gaivani's discovery, the most skilful and learned was Protesso Volta, of Como, who had been an ardent electrician from his youth. Many of our read-

electricism from his youth. Many of our read-ers have seen this year the colossal statue of that great man, which adores his native city on the southern shore of the lake. The statue was wor bily decreed, because the man who contri-butes ever so little to a grand discovery in science-provided that little is essential to itranks among the greatest benefactors of his species. And what did the admirable Volta disspecies. And what did the admirable voita dis-cover? Reducing the labors of his long life to their simplest expression, we should say that his just claim to immortality consists in thishe found out that the frog had nothing to do with the production of electricity in Galvani's experiment, but that a wet card or rag would do as well. This discovery was the central fact of his scientific cureer of sixty-four years. It took all of his familiar knowledge of electricity, acquired in-twenty-seven years of entire devo-tion to the study, to enable him to interpret Galvani's apparatus so far as to get rid of the frog; and he spent the remaining thirty-seven of his existence in varying the experiment thus freed from that "demd damp, moist, un-pleasant body." It was a severe alliction to the ollowers of Galvant and to the University of Bologua to have their darling theory of the neryous electricity so rudely yet so unanswerably refuted, 'I do not need your frog!" exclaimed the too impetuous Volta, "Give me two metals the too impetuous Volta. "Give me two metals and a moist rag, and I will produce your animal electricity. Your trog is nothing but a moist conductor, and in this respect is not as good as This was a decisive fact, and it a wet rug." silenced all but a few of the disciples of the

dead Galvani Volta was led to discard the frog by observing that no electric results followed when the two plates were of the same metal. Suspecting from this that the frog was merely a conductor stead of the generator) of the electric fluid, he tried the experiment with a wet card placed between two pairs of plates, and thus discovered that the secret lay in the metals being heterogeneous. But it cost thousands of experiments to reach this result, and ten years of ceaseless thought and exertion to arrive at the invention of the "pile," which merely consists of many pairs of heterogeneous plates, each separated by a moist substance. The weight of so much metal squeezed the wet cloth dry, and this led to varius contrivances for keeping it wet, resulting at last in the invention of the familiar "trough battery," now employed in all telegraph offices and manufactories of electro anything. Instead of Galvaui's irog, or Volta's wet rag, the conductor is a solution of sulphuric acid, which Volta himself suggested and employed. negative electricity is conveyed to the earth by a wire, and the positive is conducted from pair to pair, increasing as it goes, until, if the bat-tery is large enough, it may have the force to send a message round the world. And the current is continuous. The galvanic battery is an electrical machine that goes without turning a handle. By the galvanic battery electricity is made subservient to man. Among other things, it sends his messages, faces his type with copper, silvers his coffee-pot, and coats the inside of his baby's silver mug with shining gold.

The old methods of covering metals with a plating of silver were so difficult and laborious, that durable ware could never have been pro duced by them except at an expense which would have defeated the object. In those slow and costly ways plated articles were made as late as the year 1840; and thus they might be made at the present moment, if Signora Galvani had been looking the other way when the stu-dent touched the frog with the knife. More than fifty years elapsed before the chance dis-covery was made available in the art we are considering. For many years the discoveries of Galvani and Volta did not appear to add much to the resources of man, though they excited his "special wonder." Elderly readers can perhaps remember the appalling accounts that used to be published, forty years ago or more, of the galvanizing of criminals after execution. In 1811, at Glasgow, a noted chemist tried the effect of a voltaic "pile" of two hundred and seventy pairs of plates upon the body of a murderer. As the various parts of the nervous system were subjected to the current, the most startling results followed. The whole body shuddered as with cold; one of the legs nearly kicked an attendant over; the others heaved, and the lungs inhated and exhaled. At one time, when all the power of the instrument was exerted, we are told that 'every muscle of the countenance was simultaneously thrown into fearful action. Rage, horror, despair, and anguish, and ghastly smiles united their hideous expression on the murderer's face, surpassing far the wildest representations of a Fusseli or a Kean. At this period several of the speciators were obliged to leave the room from terror or sickness, and one gentleman fainted." The bodies of horses, oxen, and sheep were galvanized, with results the most surprising. Five men were unable to hold the leg of a horse subjected to the action of a powerful battery.

So far as we know, nothing of much importance has yet been inferred from such experiments as these. Davy and Faraday, however, and their pupils, did not confine their attention to these barren wonders. Sir Humphrey Davy took the "pile" as invented by Volta, in 1800, and founded by its assistance what may be styled an new science, and developed is to the point where it became available for the arts and utilities of man. The simple and en y process by which silver and gold are decomposed, and then deposited upon metallic surfaces, is only one of many ways in which the galvanic battery ministo our convenience and pleasure, reader will step into a manufactory of plated ware, he will see, in the plating room, a trough containing a liquid resembling tea as it comes from the teapot. Avoiding scientific terms may say that this liquid is a solution of silver, and contains about four ounces of silver to gallon of water. There are also thin plates of silver hanging along the sides of the trough into the liquid. The gaivanic battery which is to set this apparatus in motion is in a closet near by. The vessels to be plated, after being thoroughly cleaned and exactly weighed, are suspended in the liquid by a wire running along the top of the trough. When all is ready, the current of tricity generated by the small battery in the closet is made to pass through the trough, and along all the metallic surfaces therein con-When this has been done, the spectator may lock with all his eyes, but he cannot perceive that anything is going on. There is no bubbling nor fizzing, nor any other noise or motion. The long row of vessels hang silently at their wire, immersed in their tea, and nobody appears to pay any attention to them. And so they continue to hang for hours, for five or six or seven hours, if the design is to produce work which will answer some other purpose than sellwhich will answer some other purpose than selling. All this time a most wonderful and mysterious process is going on. That gentle current of electricity, noiseless and invisible as it is, is taking the silver held in the solution, and laying it upon the surfaces of those vessels, within and without; and at the same time it is decomposing the plates of silver hanging along the sides of the trough in such a way as to keep up the strength of the solution. We cannot recover from the wonder into which the contemplation of this process threw us. are some things which the outside and occasional observer can never be done marvelling at. sional observer can never be done marvelling at. For our part, we never hear the click of a telegraphic apparatus without experiencing the same spasm of astonishment as when we were first introduced to that mystery. The beautiful manner, too, in which this silvering work is done! The most delicate brush in the most sympathetic hand could not lay on the colors of the palate so evenly, nor could a crucible melt the metals into a completer openess.

the palate so evenly, nor could a crucible melt the metals into a completer oneness.

And here is the opportunity for fraud. In five minutes an article is coated with silver in every part, luside and out; and that mere "blush" of silver, as the platers term it, will receive as brilliant a polish, and look as well (for a month) as if it were solid plate. Nay, it will look rather better; since the silver deposited by this exqui-

site process is perfectly pure, while the silver

employed in solld ware is or the coin standardone-tenth alloy. The plater can deposit opon his work as little silver as he chooses, either by weakening his solution or by leaving the articles in it for a very short time; and no man can detect the cheat with certainty except by an expensive and troublesome process. affice for the operator to attend to the strength of his solutions, and keep his eye upon the clock. As in certain conditions of the atmophere we can scarcely get a spark from the elecrical machine, so there are times when the galvanic battery works teebty, and when the silvering goes on much more slowly than usual. To guard against errors from this cause, there is no sure resource but a system of careful weighings. In such establishments as that of the torham Company, of Providence; Tiffany's or Haughwout's, of New York; Bailey's, of Philadelphia; and Bigelow Brothers' and Kennard's, or Palmer & Batchelder's, or Boston, each article is weighed before it is immersed in the solution, its weight is recorded, and it is allowed to remain in the solution until it has taken on the whole of the precious metal it was designed to

There was a lawsuit the other day in New York, which turned upon the quantity of silver deposited upon sundry gross of torks and spoons. The plater agreed to put upon them twelve ounces of silver to the gross, which is about as much as is ever deposited upon spoons or forks. If he had performed his contract he would have spread over each tablespoon about as much silver as there is in a ten-cent piece; and such i the nature of silver that these spoons would have worn well for five or six years. In fact there are no better plated spoons yet in use than these were designed to be. The plater mean to comply with the usages of the trade meant to put upon those spoons the quantity of silver which, in the trade, stands for twelve ounces to the gross, which is about ten ounce to the gross. Such was probably his virtuous intention, and he supposed he had carried our that intention. But when the spoons were put to the test, it was discovered that upon one hundred and forty-four tablespoons there were but three ounces and a balf of silver. It cam out on the trial that the plater never weighed his work, and trusted wholly to the length of time he left it in the solution. He appeared to be honestly indignant at the testimony showing that his spoons, which had been left four hours subject to the action of the battery, had acquired only a film of silver. To the eye of the purchaser, these spoons would have presented precisely the same appearance as the best plated ware in existence. For two or three months, or even for six months, they would have retained their brilliancy. What their appearance would have been at the end of a year or two we need not say, for most readers have encounteerd the spectacle in their pligrimage through a world which is said to resemble plated articles of this quality in being "all a fleeting show."

Every one is familiar with the gold lining that

now to generally seen in silver vessels. is laid on by the same process as that which covers the outside with silver. The vessel is alled with a solution of gold, and in this solu-tion a thin plate of gold is suspended. The electric current being made to pass through the interior thus prepared, the liquid bubbles up like soda-water, and in three or four minutes enough gold is deposited upon the inside surface for the purpose designed. When this is accomplished octhing remains but to polish the vessel, within and without, and we have a piece of ware which s silver when we look at it, and golden when we drink from it

The obstacle to the introduction of the supe rior plated ware now made by the Gornam Company is its costliness. The best plated ware costs five times as much as the worst, and one fourth as much as solid silver. We saw the other day three large salvers, which at a distance of six feet, looked very nearly alike. of them fore a most brilliant polish, and all were elaborately decorated. One of them was a trashy article, made of an alloy of lead and tin, covered with a "blush" of silver. It had been stamped out and shaped at one blow by a stamping machine, and left in the silver solution subject to the action of the battery for perhaps fifteen minutes. It was very heavy, and when it was suspended and struck it gave forth a dull leaden sound. The price of this abomination was \$37.50, and it would last, with careful occasional usage, for a year. Daily use would disclose its real quality in a few weeks. Another of these salvers was of solid silver. which no objection could be made except that its price was \$950. The third was of that superior plated ware introduced reby the Gorham Company, of Provi cently dence. now called nickel-suver and and ringing com-nickel, and zinc-a very hard and ringing comnow called nickel-silver-a mixture of copper, pound, perfectly white, and capable of high polish. Upon this hard surface as much silver bad been deposited as upon the best Sheffield plated-ware, which is about as much as can be smoothly put upon it by the electro-plating pro cess. When the salver was struct the a bell, and it would not bend under the When the salver was struck, it rang like of a man. Such a salver, used continually, will retain its lustre for a whole generation, and when, after that long period, it begins to lose its coating, it can be resilvered and made as good as ever. But the price of this article was \$200—more than five times the cost of the leaden trash, and a fourth of the price of the solid salver. Nevertheless, plated-ware of this quality is the only kind which it is good economy to buy. There are few more extravagant pur-chases we can make in housekeeping than lead and brass-ware covered with a film of silver so thin that an ounce of the precious metal can actually be spread over two acres of it. One fact can easily be borne in mind; good serviceable plated articles cost, and must cost,

from one-fourth to one-third as much as similar articles of solid silver. Anything of a much lower standard than this is trash and For our part we prefer good plated ware to solid plate. In plated ware we can now have all the beauty of form, all the brilliancy of sur-face, all the durability and utility of solid

# LEGAL NOTICES.

ting our neighbors to shame, and without

appearing to be guilty of estentation, without

silver, without its excessive costliness,

offering a perpetual temptation to burglars.

IN THE DISTRICT COURT FOR THE CITY IN THE DISTRICT COURT FOR THE CITY AND COUNTY OF PHILADELPHIA.

MICHAEL SHAFFER VS. JOHN GATCHELL.

Levari Facias. June Term, 1867. No. 758.

The Auditor appointed by the Court to distribute the fund arising from the sale under the above writer from the tollowing described real estate, to wit.—All that ceriain lot or piece of ground situate on the south side of Coates street, at the distance of fifty five feet ten inches and three-quarters of an inch eastward from the east slde of Thirteenth street, in the late District of Spring Garden, now the Fourteenth Ward of the City of Philadelphia containing in from or breadth on said Coates street eighteen teet, and extending southward between lines at right angles with said Coates street, in length or depth on the east line thereof slity feet, and on the weat line thereof forty-three feet to the head of a three-feet wide alley leading southward isto Penn street, thence along the eastwardly side of sain alley still southward seventeen leet; bounded northward by mid Coates freet, eastward by ground now or late of William Harman, southward by ground of Mary Brown, and westward partify by a certain two feet six luches wide alley leading northward into the said Coates street, partly by the back ends of Ann W. English and Nathan Stietch's Thirteenth street lots, and partly by said three-feet wide alley leading northward into the said coates at the partly by said three-feet wide alley leading southward into said Penn street.

Will meet the partles interested for the purposes of

hree-jeet wide anny that the purposes of will meet the parties interested for the purposes of his appointment at his Office. No. 1228. FIF's H Street. in the city of Philadelphia, TUESDAY, the Irth day of December, 1867, at 4 o'clock P. M., when and where all persons interested are required to make their city of the debarred from coming in upon said fund. as, or be debarred from coming in upon said ful

IN THE ORPHANS' COURT FOR THE CITY

AND COUNTY OF PHILADELPHIA.

Estate of JOHN W WARWICK, deceased,
The Anditor appointed by the Court to audit, settle,
and adjust the account of JOHN F. METZ, Admi istrater of JOHN W. WARWICK, deceased, and to
report distribution of the balance in the bands of the
Accountant, will meet the parties interested for the
purposes of his appointment, on MONDAY, December 16 18c7, at 4 c'clock F. M., at his office, No. 49

WALNUT Street, second story, in the city of Philadeithils.

WILLIAM A. ALLESON,
Auditor. 11 scetuthat

### GARDNER & FLEMING

COACH MAKERS, NO. 314 SOUTH PIPTH STREET. New and Second-hand Carriages for sale. Par tioniar attention paid to repairing 6 30 303

### INSTRUCTION.

CUSEVESS VOTECHS.

STEVENSDALE INSTITUTE BOARDING SCHOOL FOR YOUNG LADIES. Terms-Board, Tultion, etc.-per scholastic year, \$500 NO EXTRAS.

Circulars at Messrs. Fairbanks & Ewing's, No. 718 CHESNUT Street; also at Messra, T. B. terson Brothers', No. 306 CHESNUT Street. Address, personally or by note,

N FOSTER BROWNE, Principal, 10 3 thmtf South Amboy, N. J.

FURS.

1867. FALL AND WINTER. 1867

### FUR HOUSE, (Established in 1818.)

The undersigned invite the special attention of the

Muffs, Tippets, Collars, Etc., IN RUSSIAN SABLE, HUDSON'S BAY SABLE,

Ladies to their large stock of FURS, consisting of

MINK BABLE ROYAL ERMINE, CHINCHILLA, PITCH, ETC. All of the LATEST STYLES, SUPERIOR FINISH: and at reasonable prices.

Ladies in mourning will find handsome articles PERSIANNES and SIMIAS; the latter a most beautiful fur. CARRIAGE ROSES, SLEIGH ROSES, and FOOT

MUFFS, in great variety.

#### A. K. & F. K. WOMRATH. 911 4m NO. 417 ARCH STREET.

Re-Will remove to our new Store, No. 1212 Chesnut street, about May 1, 1868.

### FANCY FURS.

The subscriber having recently returned from Europe with an entirely new stock of

FURS

Of his own selection, would offer the same to his customers, made up in the latest styles, and at reduced prices, at his OLD ESTABLISHED STORE. NO. 139 NORTH THIRD STREET,

ABOVE ARCH. JAMES REISKY.

REMOVAL.

REMOVAL-BEMOVAL

C. W. A. TRUMPLER

HAS REMOVED HIS MUSIC STORE FROM SEVENTH AND CHESNUT STS.

No. 926 CHESNUT STREET. 8 12 thrp PHILADELPHIA.

TO THE LADIES!

SOAP.

No More Dread of Wash-Day!!

IMPOTANT

### MOORE'S

ELECTRO-MAGNETIC SOAP.

## "WASHING MADE EASY,"

Accemplished without boiling or rubbing. The finest and most delicate fabrics, as well as the coarsest, made beautifully clean without boiling or rubbing, saying in the process half the time, labor,

AND ALL THE FUEL !! This is the best Scap ever invented for washing We offer this Soap to the ladies, confident that they

out it. SOLD BY ALL GROCERS.

will find, after the first trial, that they cannot do with-

GROCERIES, ETC.

SHOTWELL'S SWEET CIDER.

Our usual supply of this CELEBRATED CIDER. JUST RECEIVED.

> ALLERT C. BOBERTS, Dealer in Fins Groceries. Corner ELEVENTH and VINE Sta.

## FRESH FRUITS, 1867.

PEACHES, PEARS, PINEAPPLES,

117tep

PLUMS, APRICOTS, CHERRIES, BLACKBERRIES, QUINCES, ETC. PRESERVED AND PRESE, IN CASS AND

GLASS JARS. Put up for our particular trade, and for sale by the dozen, or in smaller quantities, by

MITCHELL & FLETCHER, 910 3m NO. 1204 CHESNUT STREET. JAMES R. WEBB.

TEA DEALER AND GROCER,

S. E. COR. EIGHTH AND WALNUT STR.

Extra Fine Southong, or English Breakfast Teas. Superior Chulan Teas, very cheap, Colong Tess of every grade. Young Hyson Teas of finest qualities,

All fresh imported.

NATIONAL UNION GROCERY AND PROVISION COMPANY.

Groceries and Provisions at Cost, OPPICE: No. 235 South THIRD Street. SPORE; No. 608 ABCH Street.

Cash Capital. President-WHILL, D. HALFMANN

T. STEWART BROWN. B.E. Corner of

8 143



TRUNKS, VALISES, RAGS, RETICULES, SHAW STRAPS, HAT CASES, POCKET BOOKS, FLASE and Traveling Goods generally.

VILLIAM S. GRANT CONMISSION MERCHANT. No. 33 S. DELAWARS Avenue, Philadelphia, ABENT 70B

Dupont's Gunpowder, Refined Witre, Charcoal, Eto, W. Baker & Co.'s Chocolaie, Coros, and Broma. Crocker Bros. & Co.'s Yellow Metal Sheathing Bolts, and Rails,